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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

UNITED STATES OF AMERICA,	Case No. 18-CR-00258 EJD
Plaintiff,	DECLARATION OF AUSA ROBERT S. LEACH IN SUPPORT OF UNITED STATES' RESPONSE TO DEFENDANT'S SENTENCING MEMORANDUM
v.	
RAMESH BALWANI,	
Defendant.	Date: December 7, 2022
	Time: 10:00 a.m.
	Court: Hon. Edward J. Davila

LEACH DECL. RE U.S.' RESPONSE TO DEF.'S SENTENCING MEM.,
CASE NO. 18-258 EJD

1   I, Robert S. Leach, declare:

2   1.   I am an Assistant United States Attorney representing the United States of America, the

3   plaintiff in this case.

4   2.   Attached as Exhibit 1 is the Supplemental Expert Report of Carl S. Saba, MBA, CVA,

5   ASA, ABV dated December 2, 2022.

6   I declare under penalty of perjury under the laws of the United States of America that the

7   foregoing is true and correct.

8   Executed this 2nd day of December 2022 in the Northern District of California.

9

10   */s/ Robert S. Leach*
                                            ROBERT S, LEACH
11   Assistant United States Attorney

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EXHIBIT 1

United States v. Holmes, et al.

Case # 18-CR-00258

Supplemental Expert Report of Carl S. Saba, MBA, CVA, ASA, ABV

Confidential

1.   I am issuing this supplemental report to my original expert report in this matter[1]

("Opening Report") in order to address criticisms of my valuation of Theranos as of

December 31, 2014 made in the Declaration of Scott Weingust dated November 30, 2022.

This supplemental report also addresses statements made in the Declaration of Tobin Reiff

dated November 30, 2022 regarding my valuation of Theranos as of December 31, 2014.

2.   Mr. Weingust states that my Opening Report makes two errors; the first is that my cost

of equity and discount rate applied in the income approach is based on unreliable data[2], and

that it is overstated[3], and the second is that my cost method under the asset approach

erroneously excluded an opportunity cost rate of return[4]. I disagree with both statements

for the reasons articulated in this supplemental report.

3.   Mr. Rieff states that my use of an option pricing model ("OPM") framework for

allocating Theranos' equity value to its securities "is inherently uncertain and based on

speculation"[5]. I also disagree with this statement for reasons articulated in this report.

Discount Rate in the Income approach

4.   Early-stage companies face many risks, and a majority of companies at this stage of

development eventually fail or barely generate any return to investors. A small proportion of

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[1] Expert report of Carl S. Saba, September 8, 2022, United States v. Holmes, et al.
[2] Declaration of Scott Weingust, November 30, 2022, paragraph 37.
[3] Declaration of Scott Weingust, November 30, 2022, paragraphs 19-23.
[4] Declaration of Scott Weingust, November 30, 2022, paragraph 37.
[5] Declaration of Tobin Rieff, November 30, 2022, paragraph 8.

these companies realize outsize success and returns for their investors[6]. As such, *actual*

returns across a VC portfolio of early-stage companies (the weighted average of successful

and unsuccessful companies) are much lower than *target returns*; the returns expected by

Venture Capital investors if the investment is successful.

5.   To apply an appropriate discount rate in an income approach, a valuation analyst must

assess whether the forecasts that were provided to them by management reflect expected

value (a weighted average of possible future results, including failure), or an optimistic

"success scenario" only. Expected value forecasts can be discounted by *actual VC rates of*

return, as both the forecast and the rate of return incorporate downside risk. "Success

scenario" forecasts must either be adjusted downwards to reflect expected value, or

alternatively, a higher *target VC rate of return* must be applied to such forecasts to

compensate for the fact that the forecast ignores downside risk.

6.   As explained in my Opening Report, the Aranca forecasts that I adopted are the most

realistic version that was available in the documents that I reviewed, but they do not

represent expected value. The forecasts assume that Theranos would realize over $113

million of revenue in 2015 (with $116 thousand of actual revenue in 2014), which would

have required the company to overcome numerous issues with the functionality and

reliability of its technology, quality standards in its lab operations, and lack of FDA approval

of the Edison[7]. The Aranca forecasts also implicitly assume that these numerous issues will

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[6] AICPA Accounting and Valuation Guide, *Valuation of Portfolio Company Investments of Venture Capital and Private Equity Funds and Other Investment Companies*, May 1, 2019, Part II- Appendixes A-C, B.04.04. Refer to graphic entitled "Venture Capital is an Unusual Creature" directly following this section.
[7] Opening Report, paragraphs 29 – 32, 103.

be solved in the very near term (inside of 2015), and do not consider a reasonable remaining development timeline for Theranos' technology prior to it achieving significant market revenue share.

7.   The above factors are not the only reasons why the Aranca forecasts do not reflect expected value. Another very optimistic assumption in the Aranca forecasts is that Theranos EBITDA profit margins will stabilize at 45% of revenue by 2018[8]. The upper quartile EBITDA margins for Theranos' peer group is 19.7% of revenue[9], less than half of what is assumed in the Aranca forecasts. Similarly, the EBITDA margins for companies which Theranos considered mature direct competitors, including Quest Diagnostics and Lab Corp, were 19.3% and 19.2%, respectively, on the December 31, 2014 valuation date[10]. If Theranos' forecasted EBITDA margins had been adjusted to reflect more realistic levels for mature companies in its industry, it would have reduced the company's projected operating profits *by more than 50%.* Such an adjustment would have had a dramatic downwards impact on the value of Theranos under my income approach.

8.   Because the Aranca forecasts I adopted do not reflect expected value as explained above and in my Opening Report, the discount rate must be increased above actual VC rates of return to compensate for this forecast bias. Mr. Weingust suggests that either a 28% discount rate should be applied as per the median of the 2015 Pepperdine Study, or alternatively a 20.65% discount rate as selected by Aranca should apply to Theranos'

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[8] Opening Report, Exhibit F.5.
[9] Opening Report, Exhibit G.2.
[10] Opening Report, Exhibit G.2.

forecasts[11]. Neither of these rates is appropriate for Theranos' highly optimistic forecasts, as they fall below or within the band of *actual VC rates of return* of 25.5% to 34.9% over a 10-year period as shown in Table 1 of Exhibit F.4 of my Opening Report. The more appropriate *target rates of return* are in Tables 2 and 3 of Exhibit F.4 of my Opening Report, and these range between *28% and 75%* as explained in my Opening report[12].

9.   Mr. Weingust also states that his 28% rate of return is supported by the 2015 Pepperdine Study[13], which represents reliable and contemporaneous rate of return data[14]. While Mr. Weingust determined that he should rely only on this one data point, I considered a broader set of information to select my discount rate[15]. The first is that the 28% discount rate cited by Weingust is only the median rate of return for early-stage VC companies in the Pepperdine Study, the range of discount rates is between *23% and 38%* if the first and third quartile of the study data set is included. The second set of information I considered is the numerous other VC rate of return studies cited in my Opening Report that indicate significantly higher ranges of target returns than the Pepperdine Study. While these other studies are older, they are still relevant and widely used in the valuation community[16] as VC

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[11] Declaration of Scott Weingust, November 30, 2022, paragraph 37.

[12] Opening Report, paragraph 104.

[13] Mr. Weingust states that I incorrectly relied on the 2021 Pepperdine study instead of the 2015 Pepperdine study. That statement is false. While footnote 5 to Exhibit F.4 of my Opening Report has a typographical error in referring to 2021, the data in Exhibit F.4 is from the 2015 Pepperdine Study. The 28% median return for early-stage companies matches the 2015 study data, not the 2021 study data. It is also consistent with that cited in Weingust's declaration.

[14] Declaration of Scott Weingust, November 30, 2022, paragraphs 19-20.

[15] It is considered best practice in valuation to corroborate key inputs from several data sources when possible.

[16] AICPA Accounting and Valuation Guide, *Valuation of Portfolio Company Investments of Venture Capital and Private Equity Funds and Other Investment Companies*, May 1, 2019, Part II- Appendixes A-C, B.04.02. Although this AICPA valuation practice aid was published in 2019, several years after the Theranos valuation date, it continues to cite the same VC studies that I considered in Table 2, Exhibit F.4 of my Opening Report, and that Mr. Weingust considers "unreliable".

rates of return data is not frequently published. The 2019 AICPA practice aid on valuation of

VC portfolio companies states the following about these studies[17] which Weingust considers

"old, out-of-date venture capital rate of return data"[18] that is unreliable:

> *Note that as discussed in paragraph B.04.03, venture capital and private equity fund*
>
> *returns have remained relatively consistent over time; therefore, despite their age,*
>
> *these academic studies are still regarded as providing reasonable indications of the*
>
> *target range of returns by stage of development*

10.   Finally, I considered the implied rates of returns that investors placed on the forecasts

they were provided as explained in the appendix to my Opening Report. Those rates of

return are between *36% and 82%*[19]. This broader set of relevant data indicates that my 45%

discount rate selection is on the low end of the applicable target rates of return for

Theranos.

Opportunity Cost / Entrepreneurial Incentive in the Cost Approach

11.   Mr. Weingust states that my valuation of Theranos' intangible assets under the cost

method renders my asset approach to the valuation of the company unreliable. In preparing

my cost method, I considered whether an opportunity cost rate of return should be applied.

Contrary to Mr. Weingust's assertion, my intentional omission of this return is not a

valuation error, but a matter of appraiser judgment. The guidance states that opportunity

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[17] AICPA Accounting and Valuation Guide, *Valuation of Portfolio Company Investments of Venture Capital and Private Equity Funds and Other Investment Companies*, May 1, 2019, Part II- Appendixes A-C, B.04.01, footnote 6.
[18] Declaration of Scott Weingust, November 30, 2022, paragraph 20.
[19] Opening Report, paragraph 104.

cost should be *considered*[20], not automatically applied in every instance. In practice, cost approaches often do not add an opportunity cost rate of return to the actual cost that would be incurred to recreate an asset. Opportunity cost is generally applied when the intangible asset cannot be monetized and earn a rate of return for investors while it is being created[21]. There is some limited evidence that Theranos was in fact able to earn some return from its technology assets as they were being developed, given that the company generated $4.7 million of revenue between 2009 and 2011[22].

12. The primary reason I did not apply an opportunity cost rate of return under my cost and asset approaches to the Valuation of Theranos is because I made generous assumptions that substantially all of Theranos' expenditures between 2004 and 2014 were productively spent and created valuable intellectual property of which a minimal proportion was obsolete as of December 31, 2014. I made these favorable assumptions for the reasons explained in my Opening Report, which included limitations in the information that was available for my assignment. Adding an opportunity cost rate of return to these already favorable assumptions would have led to a value under my asset approach that would have exceeded Theranos' going concern value under my income approach.

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[20] AICPA Technical White Paper, *Intangible Asset Valuation, Cost Approach Methods and Procedures*, 2014, p. 27. "All four cost components – i.e., direct costs, developer's profit and entrepreneurial incentive – should be *considered* in the intangible asset cost approach valuation….These economic analyses provide indications that either of these two related cost approach components should be measured: (1) entrepreneurial incentive or lost income opportunity cost *(if any)."*
[21] Appraisal Practices Board, *VFR Valuation Advisory 2*, 2016, Section 6.2.1 (d) Opportunity Costs. "These costs are only present if the asset cannot be utilized while being created". This guide is focused on the valuation of customer related intangible assets; however, it provides general guidance on the cost approach that is applicable to other intangible assets.
[22] Opening Report Exhibit B.5.

13. A rational investor will not pay the cost to recreate intangible assets, if that cost exceeds the value of the cash flows that can be derived from monetizing those assets in the marketplace. My income approach of Theranos provides an optimistic interpretation of the value that can be derived from monetizing the company's technology through going concern operations. It is a maximum value for Theranos as of December 31, 2014. Mr. Weingust's adding of an opportunity cost rate of return to my value under the asset approach results in a value that exceeds my going concern income approach. No rational buyer would be willing to purchase Theranos' assets for an elevated cost that exceeds the value of the economic returns that those assets can generate. They would in such an instance determine that a portion of the elevated cost incurred in developing the assets was wasted and is not recoverable.

Option Pricing Model (OPM) for Allocation of Theranos Equity Value

14. My assignment in my Opening Report included a determination of the equity value of Theranos as of December 31, 2014, as well a determination of how much of that equity value is allocable to each class of security within Theranos. The company had a complex capital structure on the valuation date, with multiple different classes of preferred shares, common stock, warrants, and options on common stock. These different classes of securities had different economic rights, and therefore could not be assigned the same value on a per share basis. In such instances, an equity allocation model is applied in valuation practice that will incorporate the differing economic rights of each security. The model I applied for this purpose is based on the Black Scholes Option Pricing Model (OPM).

15.   Tobin Rieff states in his declaration that my use of the OPM is "inherently uncertain and based on speculation". The fact is that the OPM is widely accepted and used method within the valuation community to allocate value of early stage companies to their complex capital structures, and this methodology is accepted by financial auditors who review such valuations that are prepared for financial and tax reporting purposes. This methodology is discussed at length in the 2019 AICPA practice aid on valuation of private equity and venture backed companies[23], as well as the 2013 AICPA practice aid on valuation of privately held company equity securities[24]. If the AICPA considered the OPM inherently unreliable, it would not devote significant sections of its valuation practice aids to the discussion of this approach. I also note that in the December 15, 2014 valuation that Aranca prepared for Theranos, they applied an OPM method to allocate Theranos' equity value to its securities[25].

16.   Valuation requires appraiser judgment regarding significant assumptions that are applied within valuation methods, and the OPM is no exception. Mr. Rieff states that because Theranos was privately held on the valuation date, the estimated equity volatility and term to liquidity of the company "are very difficult to determine"[26] for purposes of applying an OPM method. I disagree, these inputs are no more difficult to determine than other significant assumptions that are routinely developed by appraisers in preparing a valuation.

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[23] AICPA Accounting and Valuation Guide, *Valuation of Portfolio Company Investments of Venture Capital and Private Equity Funds and Other Investment Companies*, May 1, 2019, Sections 8.37 – 8.53.
[24] AICPA Accounting and Valuation Guide, *Valuation of Privately Held Company Equity Securities Issued As Compensation*, 2013, Sections 6.30 – 6.41.
[25] Exhibit 5190, pages 76 -77. The "Time of Expiration" input in the Aranca OPM model is consistently shown as 4 years across all breakpoints of the model.
[26] Declaration of Tobin Rieff, November 30, 2022, paragraph 5.

17. The term to a liquidity event that I applied in my Opening Report was 4 years. This is the

same term to a liquidity event that Aranca adopted in their December 15, 2014 valuation[27]

based on contemporaneous input from Theranos management. In addition to the 4 year

term reflecting management's outlook on the valuation date, it is also reasonable

considering that Theranos had virtually no revenue at the end of 2014, and still had to solve

significant issues with the functionality of its technology before it could gain market revenue

share and become a viable candidate for a liquidity event. It was improbable on the

valuation date that Theranos would achieve a near term exit; it was still several years away.

18. The equity volatility assumption that I applied was 53% for the December 31, 2014

valuation date, and it was based on a review of a large group of publicly traded companies

that were comparable to Theranos[28]. These included many of the same companies that

Aranca has considered in its valuation analysis and in their communications with Theranos

management. My selection of a 53% volatility was above the upper quartile of the peer

group, because I recognized that Theranos was earlier stage and more volatile than the

public companies as a whole, as Mr. Rieff states[29]. I agree that differences between the

public companies and Theranos needed to be considered, however this does not render the

entire OPM approach unreliable, and this difference was addressed in my analysis. In

addition, volatility is more significantly impacted by the size and stage of development of a

company, than whether the company is privately held or publicly traded. The data set I

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[27] Exhibit 5190, pages 74-79.
[28] Opening Report, Exhibit R.2.
[29] Declaration of Tobin Rieff, November 30, 2022, paragraph 7. "However, particularly for an early-stage private company such as Theranos, underlying equity volatility is likely to significantly differ from public companies".

considered contains some early stage public companies with smaller revenues, and higher

volatility. I emphasized these companies in the selection of Theranos' volatility.

Dated: December 2, 2022

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Carl S. Saba, MBA, CVA, ASA, ABV